



## INSTALLATION, OPERATING and SERVICE MANUAL

THE INSTALLATION OF THE UNIT SHALL BE IN ACCORDANCE WITH THE  
REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION.

**OIL-FIRED BOILER  
MODEL: NBR-3001**

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***MARKETING / PRODUCTION***  
***Newmac Mfg. Inc.***

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NOTICE TO HOMEOWNER:  
READ THESE INSTRUCTIONS  
SAVE THESE INSTRUCTIONS



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## NBR 3001 - GENERAL INSTRUCTIONS

It is the responsibility of the consignee of the unit to examine the packages for damage and, if found, to note the same on the Carrier's Bill of Lading.

The boiler is shipped in three (3)\* packages:

1. Boiler complete with casing. Barometric draft regulator is included. Domestic hot water coil is optional.
2. Oil burner\* complete with primary relay, photo-cell, and nozzle.
3. Standard control package complete with pressure relief valve; aquastat relay & well; drain valve; tridicator; flexible oil line; burner wiring cable; lockout switch wiring cable; aquastat wiring cable; pipe fittings, and instruction manual.

Note: The control package may be shipped inside the boiler crate.

MODEL	RIELLO* BURNER	B.T.U.H. OUTPUT	B.T.U.H. INPUT (USGPH)	AFUE %	NOZZLE		PUMP p.s.i.	INSERTION inches	TURBULATOR SETTING	AIR DAMPER SETTING	DESIGN GROSS STACK °F
NBR3-183	40F10	183,000	210,494 (1.51)	85.4	Delavan	1.25 X 30° B	145	4-1/2"	1.5	1.8	375
NBR3-196	40F10	196,000	227,222 (1.63)	85.1	Delavan	1.35 X 30° B	145	4-1/2"	2.0	1.9	400
NBR3-216	40F10	216,000	252,314 (1.81)	84.4	Delavan	1.50 X 30° B	145	4-1/2"	2.0	2.2	430
NBR3-236	40F10	236,000	277,406 (1.99)	83.1	Delavan	1.65 X 30° B	145	4-1/2"	2.5	2.4	460
NBR3-250	40F10	250,000	294,134 (2.11)	82.5	Delavan	1.75 X 30° B	145	4-1/2"	2.5	2.5	470
NBR3-282	40F10	282,000	335,954 (2.41)	81.6	Delavan	2.00 X 30° B	145	4-1/2"	3.5	2.7	520
NBR3-300	40F10	300,000	363,834 (2.61)	80.8	Delavan	2.25 X 30° B	135	4-1/2"	4.0	3.3	575

\* Riello burner may have air tube in separate box.

MODEL	BECKETT** BURNER	B.T.U.H. OUTPUT	B.T.U.H. INPUT (USGPH)	AFUE %	NOZZLE				PUMP p.s.i.	INSERTION inches	HEAD SETTIN G	AIR SHUTTER/BAND SETTING	DESIGN GROSS STACK °F
					Size x Angle	Hago	Del	Dan					
NBR3-179	CF375 (CF56KY)	179,000	206,312 (1.48)	84.8	1.25 X 45°	B	B	AS	140	2"	1	3.5 / 0	405
NBR3-199	CF375 (CF56KY)	199,000	230,010 (1.65)	84.0	1.35 X 45°	B	B	AS	150	2"	1	4.0 / 0	435
NBR3-212	CF375 (CF56KY)	212,000	246,738 (1.77)	83.1	1.50 X 45°	B	B	AS	140	2"	1	5.5 / 0	450
NBR3-244	CF375 (CF56KZ)	244,000	288,558 (2.07)	82.6	1.75 X 45°	B	B	AS	140	2"	0	6.0 / 0	500
NBR3-276	CF375 (CF56KZ)	276,000	330,378 (2.37)	81.6	2.00 X 45°	B	B	AS	140	2"	1	8.0 / 0	550
NBR3-285	CF375 (CF56KZ)	285,000	341,530 (2.45)	80.8	2.00 X 45°	B	B	AS	150	2"	2	7.5 / 0	575

\*\* CF56KY and CF56KZ are Air Tube Combination designations      Nozzle Specification - Del = Delavan    Dan = Danfoss

Use air settings as a guide only. Set burner air to give a trace of smoke. Re-adjust burner air to reduce CO<sub>2</sub> reading by 1% to 1.5%.

Take measurements with the burner cover installed (if any).

See burner manufacturer's instructions for more information. If settings differ, use those on the appliance label.

## BOILER INSTALLATION

### INSTALLATION REGULATIONS

This unit should be installed in accordance with the regulations of the authority having jurisdiction. In Canada the installation must conform to CSA Standard B139, "The Installation Code for Oil Burning Equipment." In the United States, the National Fire Protection Association Standard NFPA 31 should be followed. Check with provincial, state, or local codes concerning clearances, venting system requirements and other regulations governing installation. Some codes may vary from the requirements set forth in this manual.

### FOUNDATION

To ensure the boiler is on a level foundation and above any possible dampness, a cement pad is recommended.

### CLEARANCES

The minimum clearances to combustible construction are as follows:

Side: 6"	Top: 6"	Rear: 6"	Front: 24"	Flue Pipe: 9"	Approved Floor Type: Combustible
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Allow sufficient room for servicing.

***FOR YOUR SAFETY: Do not store or use gasoline or flammable vapors and liquids in the vicinity of this or any other appliance.***

### VENTING PRODUCTS OF COMBUSTION

#### Chimneys

The required minimum flue pressure is -0.04 inches of water column. The required minimum overfire pressure is -0.005 inches of water column. Locate the boiler as close to the chimney or flue as possible. The maximum draft is obtained by keeping elbows and pipe length to a minimum. Install the flue pipe with a gradual rise of at least 1/4" per foot from the boiler to the flue. Do not extend the flue pipe beyond the inside wall of the chimney. Refer to Table 7 (a) and Table 7 (b) for proper sizing and Figure 16 for optimizing chimney draft.

The owner shall provide a chimney constructed to comply with the following specifications:

- (a) The chimney must be absolutely smoke tight throughout its entire length, and must extend at least three feet (3') above a flat roof or two feet above the ridges of peak roofs.
- (b) If built of a single thickness of brick or of cement blocks, it shall be lined throughout its entire length with fire clay lining, having not less than three-fourths inch (3/4") thickness. Flue lining is to be laid in mortar and made air tight. If the chimney is of the prefabricated type, it must be an approved class "A" chimney or type "L" Vent for interior.
- (c) The boiler flue must have no other openings for attaching any fireplace, stove, range, gas or ventilating connection unless the equipment is appropriately certified.
- (d) If it is necessary to offset the flue, it must be done in such a manner as not to reduce the gross cross-sectional area or create a ledge or obstruction, where loose material may lodge.
- (e) Flue pipe connections must be secured with metal screws.

***CAUTION: Oil-fired appliances shall be connected to flues or vents having sufficient draft at all times to ensure safe and proper operation of the appliance.***

#### Barometric Draft Regulator

The Listed/Certified draft regulator must be installed between the appliance and the chimney, within easy reach for adjustment and free from obstruction. Use larger or multiple draft regulators for chimneys with strong draft. Follow the draft regulator manufacturer's instructions for proper installation.

#### Power Venting

Consult installation codes for requirements and approvals governing power venters and draft inducers. Follow the instructions supplied with them for proper installation.

## PIPING

Locate the boiler as close as possible to the center of the heat distribution system and make sure the top is level. Typical Piping Layouts are shown in Figure 10 and Figure 11.

### Radiant Floor Piping

Only pipe certified for in floor applications should be used. Cross-linked polyethylene (PEX) pipe with the ASTM F876 designation is widely used. Polybutylene (Poly B) has a lower temperature and pressure rating than PEX and is more susceptible to kinking. Non-metallic pipes must have an oxygen diffusion barrier to prevent oxygen molecules from passing through their walls. Oxygen entering the hydronic system may cause degradation of the components.

## AIR PURGE

Air in water at normal atmospheric conditions promotes corrosion. Since corrosion is a chemical reaction and chemical reactions increase with temperature, at boiler operating temperatures the corrosion factor must not be overlooked. Air can also cause noise and circulation problems. Once in operation and purged of air the only source of new air should be the makeup water. Automatic air vents placed at high points in the piping system usually will relieve this problem. Installation of a microbubble resorber air eliminator (Spirovent) in the supply line is highly recommended.

### Chemical Additives

A corrosion inhibitor is required to further guard against oxygen in the system and growth of anaerobic bacteria. Glycol should only be used if the possibility of freezing exists--a non-toxic propylene glycol must be used. Glycol significantly decreases the system efficiency, therefore the minimum amount should be used.

## ELECTRICAL CONNECTIONS

Standard boiler models are rated at 120 V, 60 Hz, 1-Phase, 15 Amp Fuse. Other voltages are available. Refer to the certification label prior to making electrical connections. Follow the National Electrical Code as well as provincial, state, and local regulations. Figure 12 shows a standard wiring schematic.

**WARNING: Make sure the electrical lockout switch is operating properly. Power to the burner should be interrupted when the front access cover is opened or removed.**

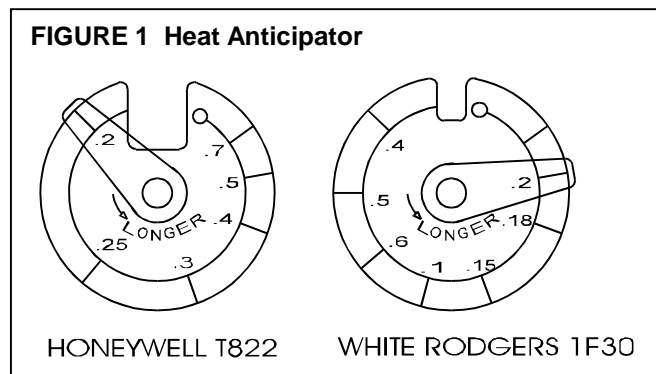
## THERMOSTAT

Locate the thermostat on an interior wall free from drafts approximately 5 feet above floor level. The operation of the burner is normally controlled by the room thermostat, which may be set for the temperature desired, typically 70°F. If a higher or lower temperature is desired, the indicator should be set to the proper point on the scale.

### THERMOSTAT HEAT ANTICIPATOR

To prevent short cycling, the heat anticipator should be set as recommended in the specifications for the burner control. This is typically set at 0.2 amps as indicated in Figure 1. This adjustment changes the thermostat's response time to prevent the room temperature from over-running the thermostat setting.

**FIGURE 1 Heat Anticipator**



**WARNING: The heat anticipator will BURN OUT if 25 volts are applied directly to the thermostat by shorting out the primary control during testing or incorrect wiring. If this happens the thermostat warranty is void.**

## **GAUGES**

The pressure and temperature gauge supplied with the boiler has a 1/2" NPT connection. Refer to Figure 9 for its location.

## **TANKLESS DOMESTIC HOT WATER COIL**

For boilers equipped with tankless coils, installing the aquastat in the top tapping is not recommended. Mounting the aquastat on the coil plate allows the burner to respond faster to flow through the tankless coil increases the availability of domestic hot water. In areas where hard water may be a problem, a water softener is recommended. Mineral deposits will reduce heat transfer and restrict flow. An indirect storage tank is recommended if high consumption of domestic hot water is anticipated.

## **BACKFLOW PREVENTER**

To prevent contamination of potable water a backflow preventer is required. Be sure the inlet side is connected to the domestic water supply. Do not use a single check valve for this purpose.

## **FLOW CHECK VALVES**

Use a flow check to prevent thermal siphoning or gravity flow when the circulator is off. Pump differential is required to open the valve. Observe flow direction when installing these valves.

## **PRESSURE RELIEF VALVE**

A 30 p.s.i pressure relieve valve is supplied with the appliance to protect against excessive water pressure caused by thermal expansion of the water or emergency steam conditions caused by runaway overfiring. It has 3/4" NPT for connection to the top (highest point) of the boiler. Refer to Figure 9 for its location. Orient the valve vertically and so that blow off is directed out of harms way. To avoid water damage, a drain pipe of the same size as the valve outlet can be connected --it must be pitched down. An occasional drip from the valve is normal. Do not install a shut off valve between the outlet and disposal site. The blowdown pipe should terminate about six inches from the floor for unrestricted flow, preferably near a floor drain. Replacement valves should have the same rating as the original one and be ASME approved. Relief valves are rated according to B.T.U.H.

## **LOW WATER CUT-OFF**

Some jurisdictions may require a safety control to guard against low water situations. A 3/4" NPT tapping is provided to mount this control directly on the boiler

## **PRESSURE REGULATING VALVE**

A pressure regulating valve is not part of the standard controls package. Since local regulations may require installation of this type of valve they are available as an option from Newmac. The function of this control valve is to regulate the boiler feed water to 12 or 15 psig to compensate for the water main working pressure which may be excessive. For convenience these valves incorporate an internal bypass for fast filling and air purging of the system. It must be mounted in a horizontal position in the cold water supply upstream from a shut-off valve. Be sure the flow direction arrow is pointing toward the system.

## **EXPANSION TANK**

Water expands as it is heated. Normal operation requires the boiler and piping to be full of water. As the water is heated an airtight tank located above the boiler provides a place for the additional volume of water to go. With a compression tank air trapped in the system will migrate to the upper part of the tank above the water level. The tank should be sized based on the boiler output rating and the water capacity of the system.

## **AQUASTAT CONTROL**

This control has a probe mounted in a well and immersed in the boiler water to sense temperature. It is thermally operated with three settings to regulate boiler water temperature for space heating equipment and domestic hot water service. The operation of the Honeywell control as shown in Figure 2 is discussed here. Refer to Figure 9 for its location.

High Limit Setting: This setting regulates burner operation. When the high limit setting is reached on temperature rise dangerous overheating of the boiler is prevented by cutting power to the burner. The temperature has to fall by 10 F before power is restored .

**Note: The high limit must be set at least 20 F higher than the low limit setting.**

Low Limit Setting: This setting controls the minimum standby temperature. It regulates circulator and burner operation. When the low limit setting is reached as the boiler water temperature increases the burner circuit breaks and the pump starts circulation of hot water. The circulator continues to operate to satisfy the call for heat from the thermostat until the water temperature falls 10 F below the set point. The burner circuit makes when the water temperature falls 10 F below the low limit set point.

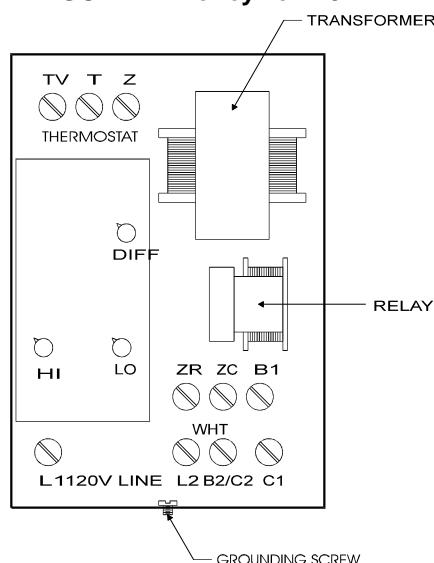
Differential Setting: This setting only effects the low limit operation. The circulator make and burner break temperature can be elevated by raising this setting. This temperature will be the set point temperature plus the difference between the differential setting and 10 F. The differential setting does not change the burner make and circulator break temperature. The recommended aquastat settings are as follows:

HI 180	LO 160	DIFF 20
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Aquastat Control Operating Sequence with Room Thermostat Calling: The burner starts if the boiler water temperature is less than 170 F. With the low limit set at 160 and the differential set at 20 F, the circulator starts on a temperature rise at 170 F. The circulator runs distributing hot water through the system until the temperature falls to 150 F. When the high limit setting of 180 F is reached the burner shuts off. The burner will restart as the temperature falls by 10 F to 170 F.

Aquastat Control Operating Sequence with Room Thermostat not Calling: With the low limit set at 160 and the differential set at 20 F the burner shuts off at 170 (low limit setting minus 10 F plus the differential setting). The burner restarts when the boiler water temperature falls below 150 F (low limit setting minus 10 F).

**FIGURE 2 Honeywell L8124L.**



#### **OPTIONAL AQUASTAT**

White Rodgers 8B43A-601 is certified as an alternate control.

#### **CONTROLS**

#### **CIRCULATOR**

Flush the system to remove foreign matter. Operate the circulator for 5 minutes immediately after filling the system to purge air pockets.

#### **MIXING METHODS**

A method of mixing is required for boiler protection with low temperature systems. The minimum return water temperature required is 135 F.

##### Mixing Valves

A three-way mixing valve can be used in most conventional systems such as baseboard radiation as long as a minimum return water temperature of 135 F can be maintained.

A four-way mixing valve is commonly used for radiant floor applications. This will allow blending to maintain the relatively high boiler loop temperatures while sustaining the lower temperatures required for radiant floor heating. Most mixing valves can be controlled manually or with an automatic motor.

##### Injection Systems

Controls for mixing using variable speed injection pumps, on/off injection pumps and on/off injection valves are readily available.

## ZONE VALVES

Conventional zone valves operate in either a fully open or fully closed position. Most are normally closed until the thermostat calls for heat. Some models have an end switch that activates the circulator when the valve is fully open. Some newer valves are designed to modulate flow.

## ANTI-SCALD VALVES

An automatic thermostatically controlled tempering valve is required to prevent scalds. It should be located approximately 10 inches below the domestic hot water supply outlet. This will keep the valves bi-metallic thermostat element from sensing non-flowing hot water. Manually operated valves are not suitable for use as anti-scald valves.

## HOT WATER EXTENDER TEMPERING VALVES

A good quality valve is recommended to mix the domestic hot water supplied by the tankless coil or indirect storage tank with the cold water supply to produce a comfortable temperature. The ability of the valve to maintain a constant temperature is proportional to the quality of the valve. The valve must be installed according to the valve manufacturer's instructions with a suitable balancing valve and thermal heat trap if specified.

## DHW BALANCING VALVE

A modulating type valve should be used to achieve the desired blend of hot and cold water.

## FLOW RESTRICTOR

A flow restrictor valve is often used for constant flow, energy conservation and water management. These valves are useful where high temperature is required and flow rate can be reduced. Flow restrictors are available that are designed for tankless heater applications. For systems with pressures exceeding 50 psi it is good practice to install a flow restrictor.

## OUTDOOR RESET CONTROL

This control adjusts the water temperature supplied to the distribution system according to the required heating load. The supply water is controlled automatically based on the correlation between the required supply water temperature and actual outdoor temperature. Boiler outdoor reset should not be used if a tankless coil is used.

## GATE VALVES

Gate valves are designed for component isolation. They should be fully open or fully closed. A ball valve can be used as a lower cost alternative.

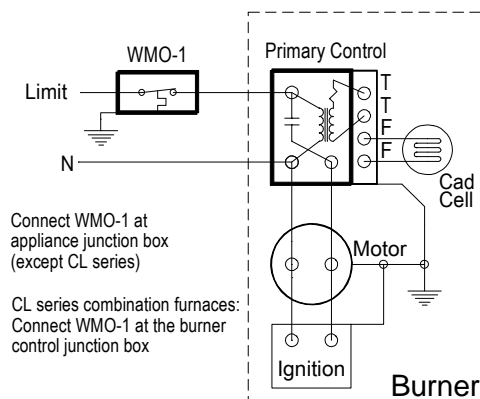
## GLOBE VALVES

Flow regulation can be accomplished with globe valves.

## Blocked Vent Switch

The WMO-1 blocked vent control is required on Newmac oil-fired and combination furnaces or boilers installed in Canada. The WMO-1 switch must be installed on the chimney vent pipe for Newmac oil fired furnaces and boilers; and installed on the burner plate for Newmac combination wood/oil or coal/oil fired furnaces. Do not use the WMO-1 Blocked Vent Switch with the Newmac Sealed Vent System (SVS). Refer to the Newmac and Field Controls Instructions enclosed in the WMO-1 package.

### Wiring WMO-1



## FUEL SYSTEMS

Fuel not heavier than No. 2 fuel oil must be used. The oil tank must be of an approved type--ULC labeled in Canada and ULI labeled in the United States. Install the oil storage tank or tanks according to local codes and regulations. The supply tank should be kept at least 1/4 full. Suction and return lines should be of the same diameter and extend to the same depth in the tank. An emergency oil shut-off valve should be installed as required by local ordinance. This can be manual, electric solenoid, or vacuum operated. An oil safety valve that cuts the fuel supply unless a vacuum is created by the pump is recommended. Any leaks in the system will prevent oil from flowing. Suntec PRV or Webster OSV valves are recommended.

## COMBUSTION AND VENTILATION AIR

Free air for combustion and ventilation must be permanently provided to the boiler room. Combustion air refers to the total air requirements of the fuel burning appliance. This includes air for the combustion process and air to provide chimney draft (dilution air). Ventilation air ensures free circulation of air in the room where the appliance is located to keep ambient temperatures within safe limits under normal conditions.

Boilers installed in tight houses, in houses with unbalanced air flows, or in enclosed spaces are very likely to have homeowners complain of smoke, fumes, burner lockouts, and excessive fuel consumption. This is more prevalent in post 1985 construction due to the tighter building construction as prescribed by the latest building codes. Regulations are relatively specific on the minimum allowable quantities of ventilation and combustion air required once the space category is determined. However, every house is subjected to different internal and external conditions and regulations vary among localities. With this in mind, Newmac requires provision for combustion and ventilation air as specified in Table 1. Table 1 is based on; relevant codes and regulations, assumptions, generalizations, and simplifications.

Values indicated in Table 1 are based on the maximum input rating. However, in making combustion and ventilation analysis the aggregate input rating of all appliances in the space must be considered.

The installation of additional oil-fired appliances may require more combustion and ventilation air. Allowances must also be made for the blocking effect of louvers, grilles and screens. If the design and free area is unknown, assume wood louvers have 20-25% free area and metal louvers and grilles have 60-75% free area. Screens should not be less than 1/4 inch mesh.

**Table 1 Combustion & Ventilation Air Sizing**

FLOOR AREA (Square feet)	SPACE CATEGORY	Vertical Ducts & Direct Opening Sizes			Horizontal Duct Sizes (in.)		
		Free Area (in. <sup>2</sup> )	L X W (QTY) (in. X in.)	Dia. (QTY) (in.)	Free Area (in. <sup>2</sup> )	L X W (QTY) (in. X in.)	Dia. (QTY) (in.)
more than 1,150	Unconfined	73	8 X 10 (1)	10 (1)	73	8 X 10 (1)	10 (1)
1,150 or less	Confined	91	10 X 10 (2)	11 (2)	182	12 X 16 (2)	16 (2)

The free area of ducts specified in Table 1 assume air is conveyed from outdoors.

The following should be kept in mind when using Table 1:

- All applicable codes and regulations must be followed.
- Unconfined free area values for openings to outdoors are based on 1 sq in per 5,000 Btu/hr of the maximum input rating.
- Confined free area of vertical ducts is based on 1 sq in per 4,000 Btu/hr of the maximum input rating.
- Confined free area of horizontal ducts is based on 1 sq in per 2,000 Btu/hr of the maximum input rating.
- Two openings of equal size are required for confined spaces.
- Maximum length of run for ducts is 50 ft. Duct size allowances must be made for longer runs.
- Ducts should be designed or insulated to prevent condensation. If insulating, a minimum insulation value of R-3 is required.
- In the case where one opening or duct is specified and combustion and ventilation air is still inadequate, a second duct may be required. Locate one high and the other low for air circulation.

**It is particularly important to duct the cold air as close to the appliance as possible. A means of closing the air openings when the appliance is not operating may be required.**

**Guidelines to determine the need for additional combustion and ventilation air may not be adequate for every situation. If in doubt, it is advisable to err on the safe side and provide additional air.**



Figure 4 shows a typical appliance installation. In this case there is a furnace and a water heater in an enclosed space--both require ventilation and combustion air which is delivered by the top and bottom air ducts. As long as adequate combustion and ventilation air is supplied, this type of arrangement offers several advantages:

- The incoming cold air is confined to the furnace room. Therefore, the occupants are less susceptible to drafts. Cool outdoor air will be tempered by the ambient temperature of the furnace room before it enters habitable spaces.
- Noise levels may be reduced.
- The furnace will be less susceptible to combustion spillage and backdrafting in low draft situations reducing odor and smoke. Moderate amounts of smoke and fumes will be contained and expelled safely outdoors.
- Incomplete combustion of any carbon based fuel may produce deadly carbon monoxide. Ventilation may dilute any CO produced under abnormal operating conditions.
- Adequate air for combustion will yield the proper air fuel ratio. Appliances burning fuel rich will produce soot and burn excessive fuel quantities. A 1/8 inch thick deposit of soot on the surface of the heat exchanger is equivalent to 1 inch of fiberglass insulation.
- Modern efficient furnaces and boilers tend to be physically smaller than their predecessors. As a result, hot surfaces such as flue connectors are not as high as they used to be. A separate furnace room with a "child proof" door is an important safety precaution.

## **OIL BURNER OPERATING INSTRUCTIONS**

### **BURNER CARE**

This burner is fully automatic in operation. All adjustments should be made by a qualified technician. Keep the burner free from excess dirt and moisture. Oil leaks should be tended to immediately. The motor should be given a few drops of SAE 20 non-detergent oil at least two or three times a year. No other parts require lubrication.

***CAUTION: Do not use gasoline, crankcase or any oil containing gasoline. Do not tamper with the unit or controls--call the serviceman. Do not attempt to start the burner when excess oil has accumulated, when the unit is full of vapor or when the combustion chamber is very hot. Do not start the burner unless the cleanout doors are secured in place. Do not burn garbage or paper in the heating system. Never leave combustible materials such as paper or rags near the unit.***

### **OIL BURNER INSTALLATION**

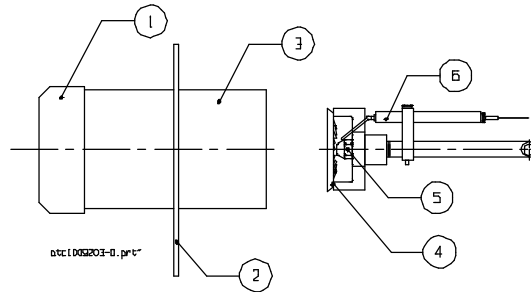
Install the oil nozzle in the burner firing assembly, and check the adjustments. Figure 5 and Table 3 can be used to obtain the correct electrode settings. These settings are critical for proper burner operation. Some burner manufacturers have a gauge available for setting the electrodes. Most burners with adjustable heads have preset stops to ensure the distance from the nozzle face to the face of the retention head ("Z" dimension) is correct. Set the air tube insertion depth according to Figure 6 and Table 3. This is the distance from the face of the mounting flange to the face of the retention head.

Use the **GENERAL INSTRUCTIONS** in this manual for preliminary air settings for the burner.

### BECKETT CF56KZ and CF56KY AIR TUBE COMBINATION / PARTS

The CF56KZ has an L1 S Turbulator. The CF56KY has a V1 turbulator. The air tubes and end cones are the same.

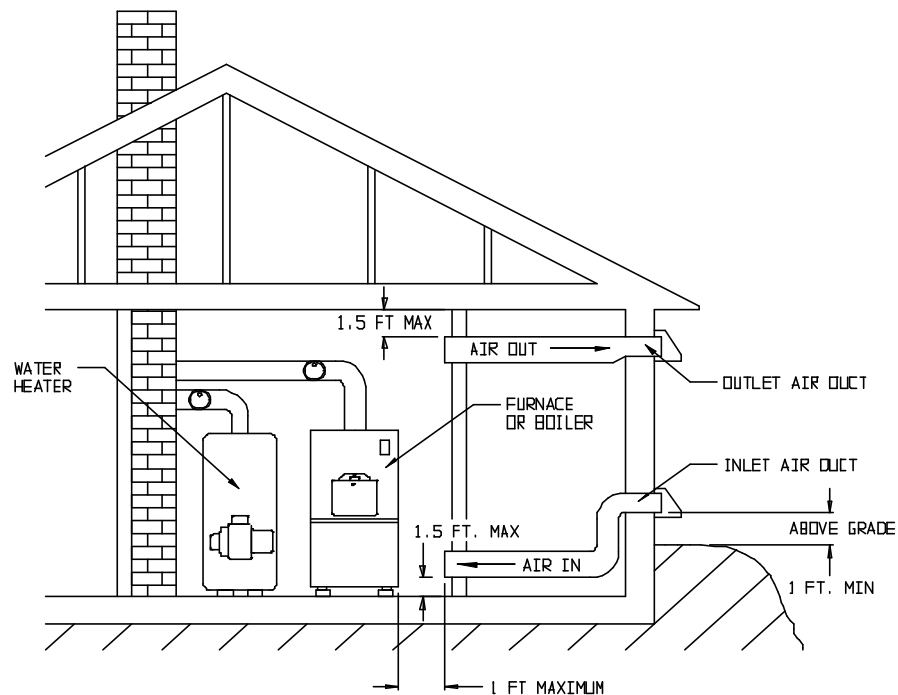
**FIGURE 3 BECKETT CF56KZ and CF56KY AIR TUBE COMBINATION**



**TABLE 2 BECKETT CF56KZ and CF56KY AIR TUBE COMBINATION PARTS**

Item	Newmac Part Number		Description
	CF56KZ	CF56KY	
1			End Cone (Welded)
2	2090077	2090077	Flange (Welded @ 2" Insertion)
3			Air Tube (Welded)
4		2090078	Turbulator, V1 (1.48 to 1.65 USGPH)
	2090079		Turbulator, L1S (2.07 to 2.45 USGPH)
5			Nozzle
6	2090080	2090080	Electrode Assembly (5-3/4" Usable)

**FIGURE 4 APPLIANCE LOCATED IN CONFINED SPACE WITH ALL AIR FROM OUTDOORS**



## START-UP AND ADJUSTMENT

### SET-UP INSTRUMENTS

The installer must use a suitable draft gauge, smoke tester, carbon dioxide tester, 0-750 F stack thermometer, 0-200 psi oil pressure gauge, 0-30 in. Hg. vacuum gauge, and 0-220 F thermometer to properly set-up the burner.

1. Turn on supply power and set the thermostat above room temperature.
2. Open all oil lines and valves.
3. Make sure the oil pump by-pass plug is correctly located for a one or two pipe system. Bleed the oil pump (refer to pump manufacture's instructions).
4. Adjust the air band on the burner until a #1 smoke or less is reached using a smoke tester. If a smoke tester is unavailable, slowly close the air band until the fire becomes smoky. Slowly increase the air until a small amount of smoke is observed at the flame tips.
  - If the unit fails to start, check: (a) oil supply; (b) ignition electrodes and transformer; (c) cad cell.
  - If the burner goes off on safety, do not push the reset button on the primary control for at least 10 minutes.

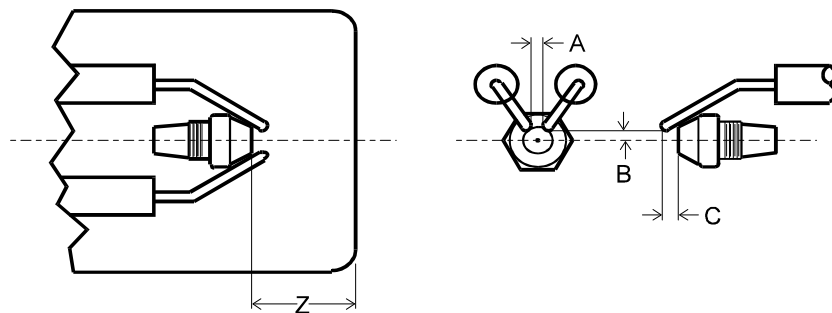
**Do not push the reset button more than once before correcting the cause.** If the burner still does not start, press the reset on the burner motor.

5. Using a draft meter, adjust the barometric draft regulator to measure -0.04 inch water column. This requires that a 5/16" diameter sampling hole be made between the flue collar and the draft regulator.

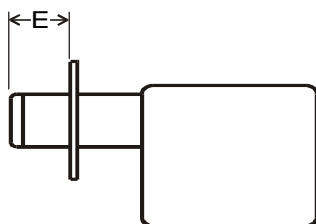
### SEASONAL OR EXTENDED SHUT DOWN PERIODS

When the burner is not to be used for an extended period of time, set the thermostat at its lowest value, turn off the main switch and close the oil burner supply valve. If the heating unit room is damp, protect the burner against dirt and moisture with a light cover. To resume operation, remove the cover and inspect the burner. Remove any dirt and debris gently to avoid the need to adjustment the air band. Open the supply valve and turn on the main switch. If the burner fails to operate see the **MAINTENANCE & SERVICE** section of this manual.

**FIGURE 5 ELECTRODE SETTINGS**



**FIGURE 6 BURNER INSERTION**



**TABLE 3 DIMENSIONAL RELATIONSHIPS**

	Riello F-10	Beckett CF 375
A	5/32"	
B	13/64"	1/4"
C	5/64" to 7/64"	1/8"
Z	1-7/16" to 1-9/16"	
E	4-1/2"	2"
Refer to Burner Manufacturer's Instructions		

## MAINTENANCE & SERVICE

Maintenance and servicing must be done by a qualified burner technician or shortened boiler life and poor efficiency may result. Under Tests and Observations and Requirements in CSA B139, the installer is required to perform tests to ensure proper and safe operating conditions. Newmac requires the installer to fill out the **INSTALLER INFORMATION** sheet found in this manual.

The heat exchanger and firetubes should be inspected on an annual basis. If cleaning is required, open or remove smoke boxes--take care not to break the ceramic liners or gaskets. Use a wire brush (available from Newmac) to loosen scale and soot and a vacuum cleaner to remove it from the boiler. Replace gaskets if necessary before closing or replacing the smoke boxes. A layer of soot on the heat exchanger surfaces and firetube walls will reduce heat transfer and can increase fuel consumption significantly. A 1/32" layer of soot acts as an insulator and can result in a 3% increase in oil burned. Likewise a 1/16" layer may result in an average fuel loss of 8%.

### OIL FILTER

The oil filter should be cleaned or replaced at least once a year by the serviceman. Use a 10 micron or better filter. We recommend General Filters Model GF-CGF10 (refill GF-K10GF) or Garber Model 11BV-R.

### OIL PUMPS & FUEL SYSTEMS

Make sure the by-pass plug is correctly located for a one or two pipe system. Failure to do so may damage the pump. Generally, for 3/8" copper tubing the vertical lift should not exceed 8 feet and the horizontal run should be limited to 30 feet. Do not exceed 10 p.s.i. inlet line pressure.

Single pipe systems are recommended for gravity feed or when the tank outlet is at a higher elevation than the pump inlet. Refer to Figure 8 (a). The inlet vacuum should be no more than 6" Hg.

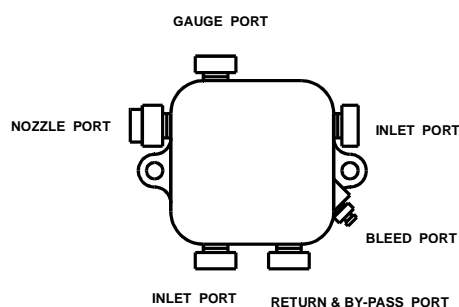
Two pipe systems are recommended for lift feed or when the pump inlet is at a higher elevation than the tank outlet. Install the return line termination higher than the supply intake as shown in Figure 8 (a). Generally, the inlet vacuum should be no more than 12" Hg.

Correct piping is critical to long-term operation of the fuel system. Never use compression fittings. Minimize the resistance to flow due to excessive line lengths; high lift; and unnecessary fittings, kinks and bends. This will decrease the running vacuum and the risk of air separation. A "Tigerloop" fuel oil de-aerator may improve the performance of poorly designed fuel oil delivery systems.

### Pressure Check

Install the pressure gauge directly on the gauge or nozzle port. Adjust to the pressure specified by Newmac for the nozzle input rating. Refer to the **GENERAL INSTRUCTIONS** in this manual or the certification label.

**FIGURE 7 TYPICAL OIL PUMP**



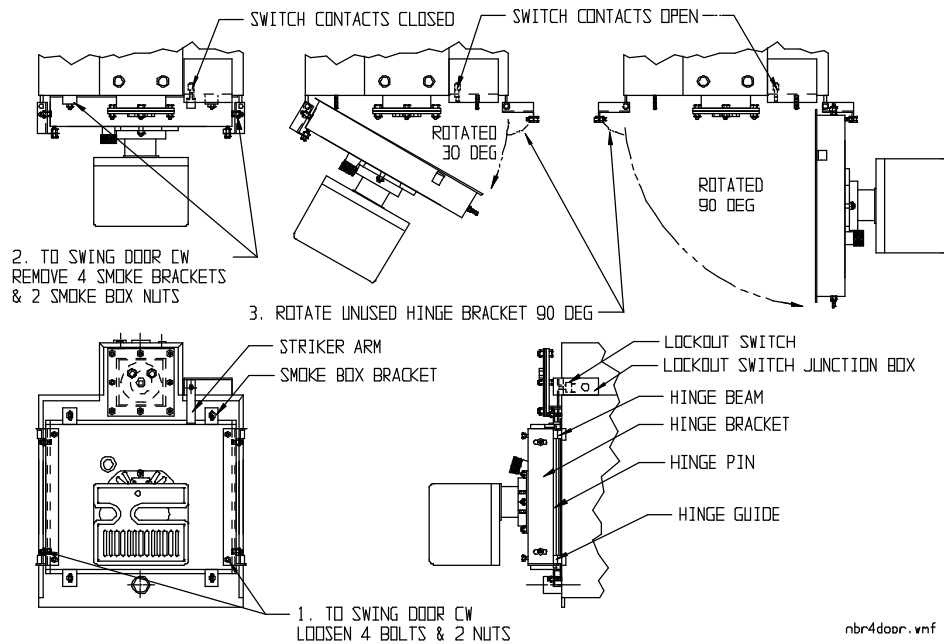
Each oil burner should have its own suction line. A common return line can be used as long as the diameter is large enough. Check valves are not required on properly installed systems. Service on fuel units should not be attempted without a suitable vacuum and pressure gage.

***The information presented here is intended as a guide only. For piping system design data, consult the installation instructions from the pump manufacturer.***

### FLEXIBLE OIL LINE

The flexible oil supply line shipped with the boiler must be installed between the oil pump and the oil line from the storage tank. For a two pipe system a similar flexible return line is required and may be obtained from your distributor. See Figures 8 (a) and 8 (b).

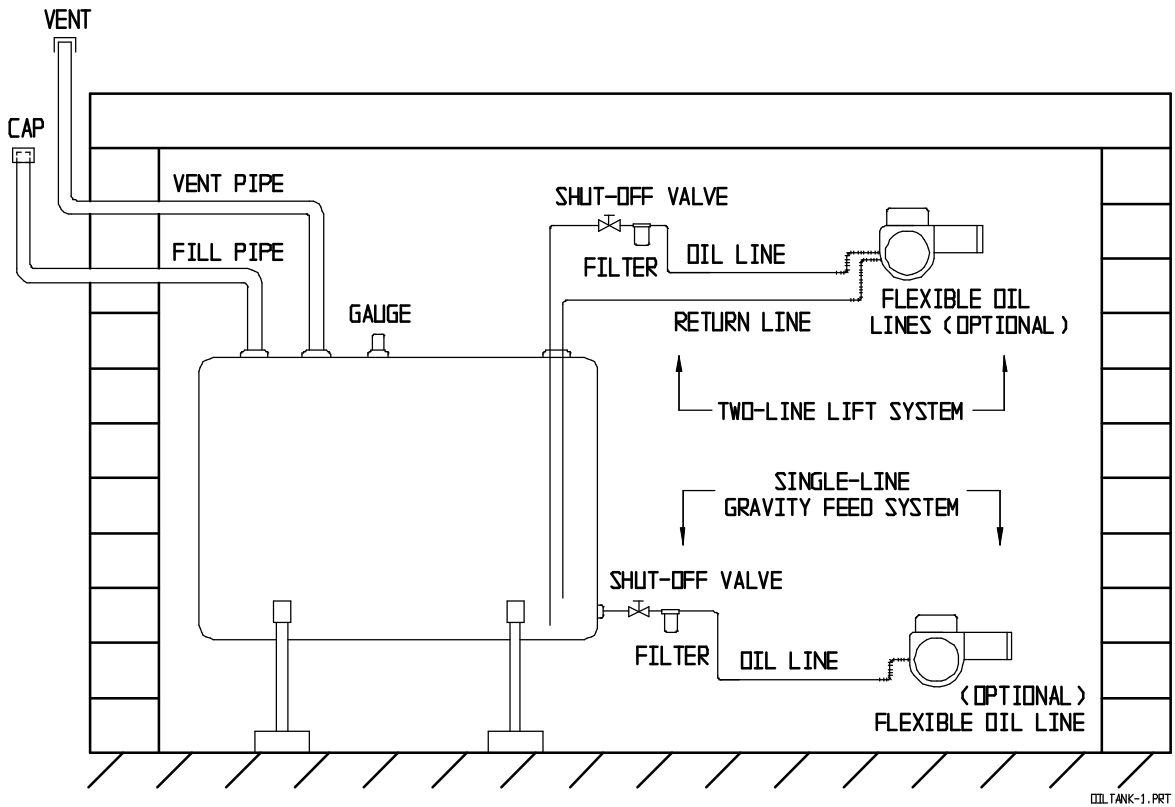
## FRONT ACCESS DOOR



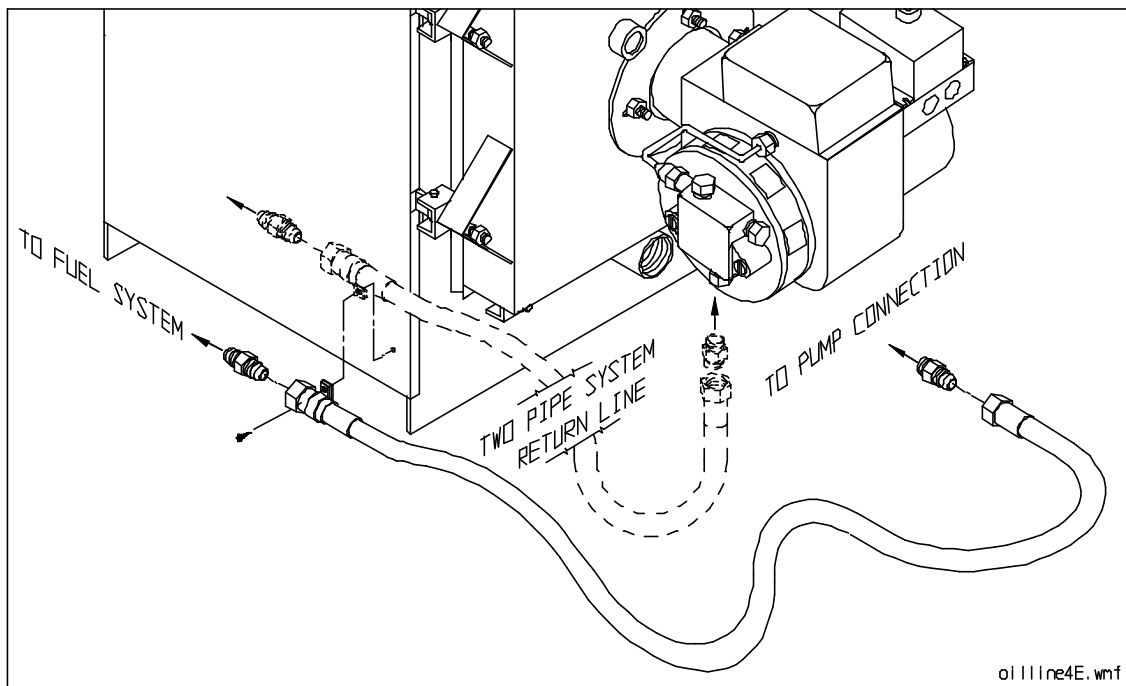
## WARRANTY

The following information is required to process warranty claims, owner's name and address; serial number; model number; installation date; and name, address and phone number of installer. A "Returned Goods Number" must be issued by Newmac prior to acceptance of returned goods. Refer to your LIMITED LIFETIME WARRANTY for terms and conditions.

**FIGURE 8 (a) TYPICAL OIL TANK PIPING INSTALLATIONS**



**FIGURE 8 (b) FLEXIBLE OIL LINE INSTALLATION**



**FIGURE 9 DIMENSIONS & CONTROL LOCATION**

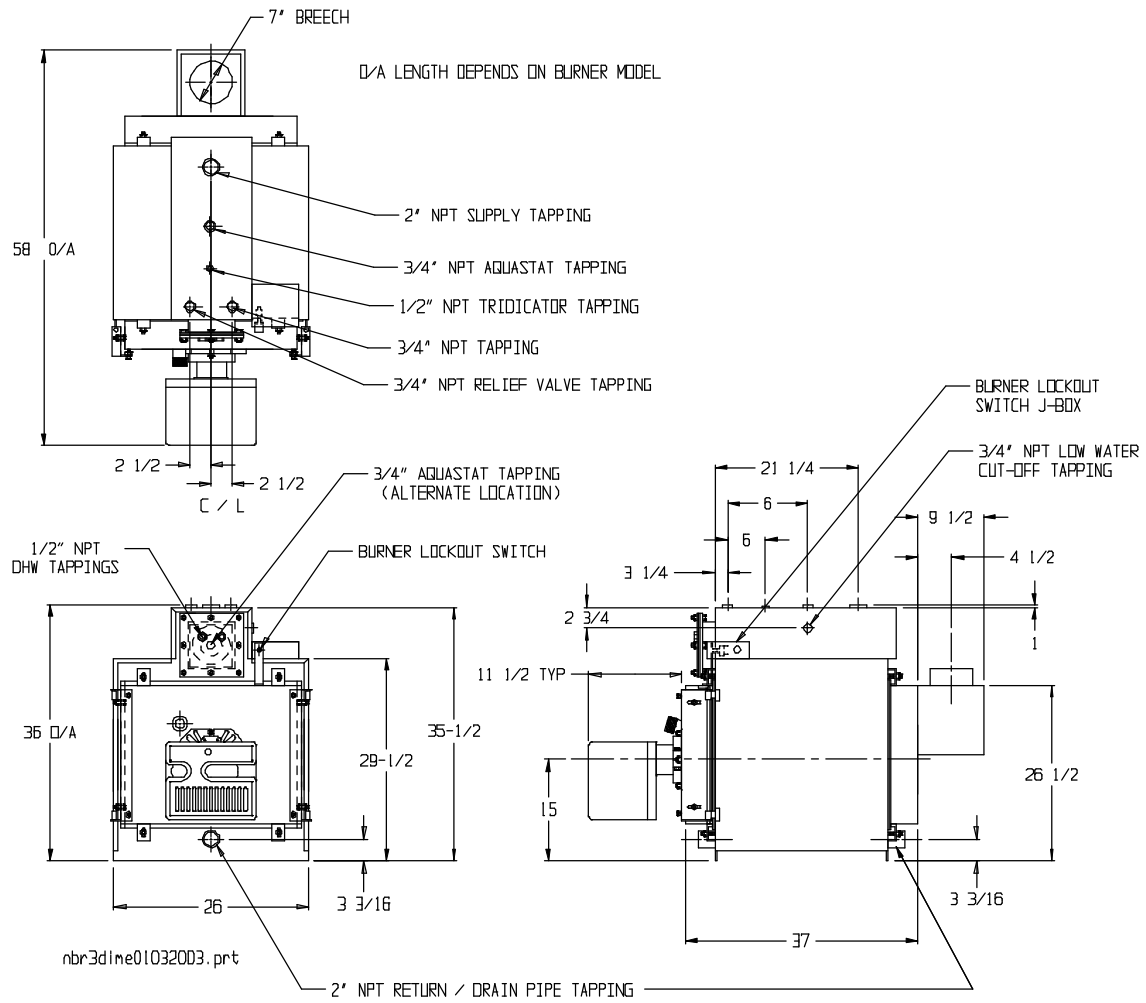
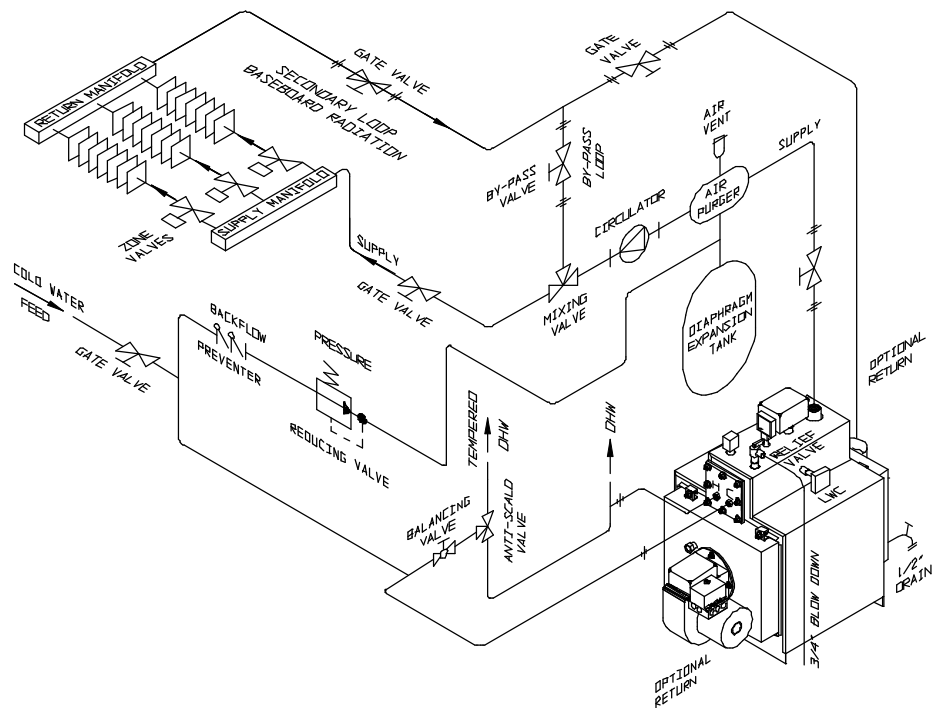
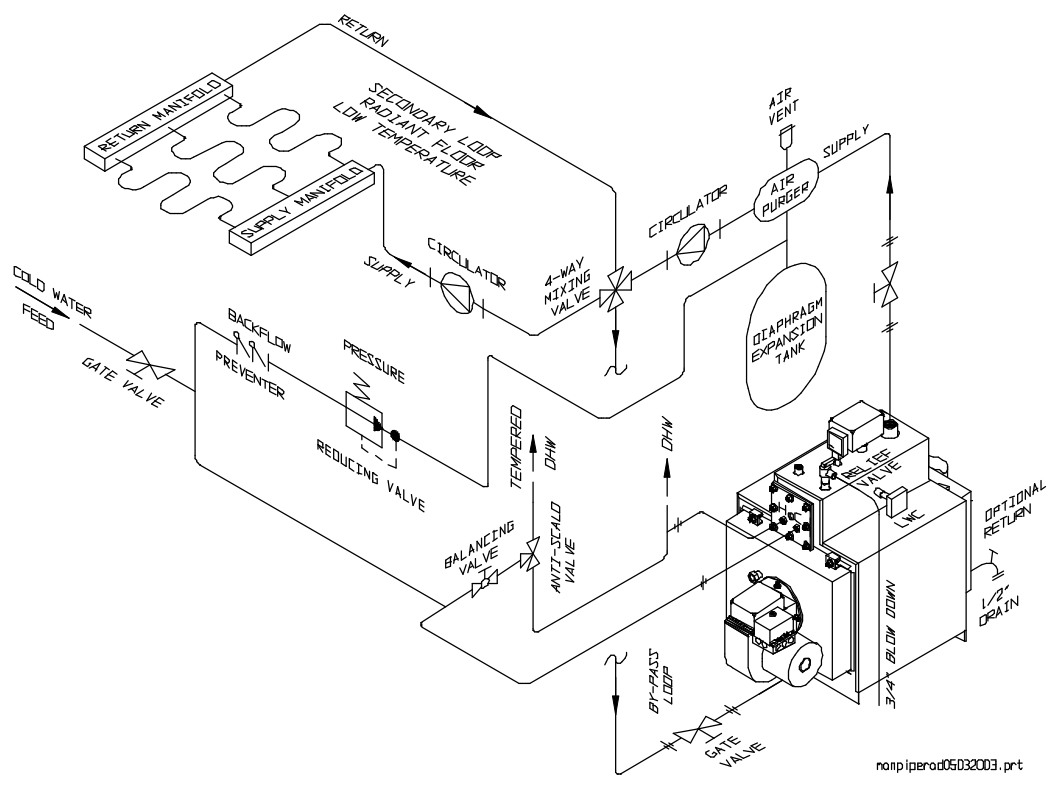


FIGURE 10 TYPICAL PIPING LAYOUT



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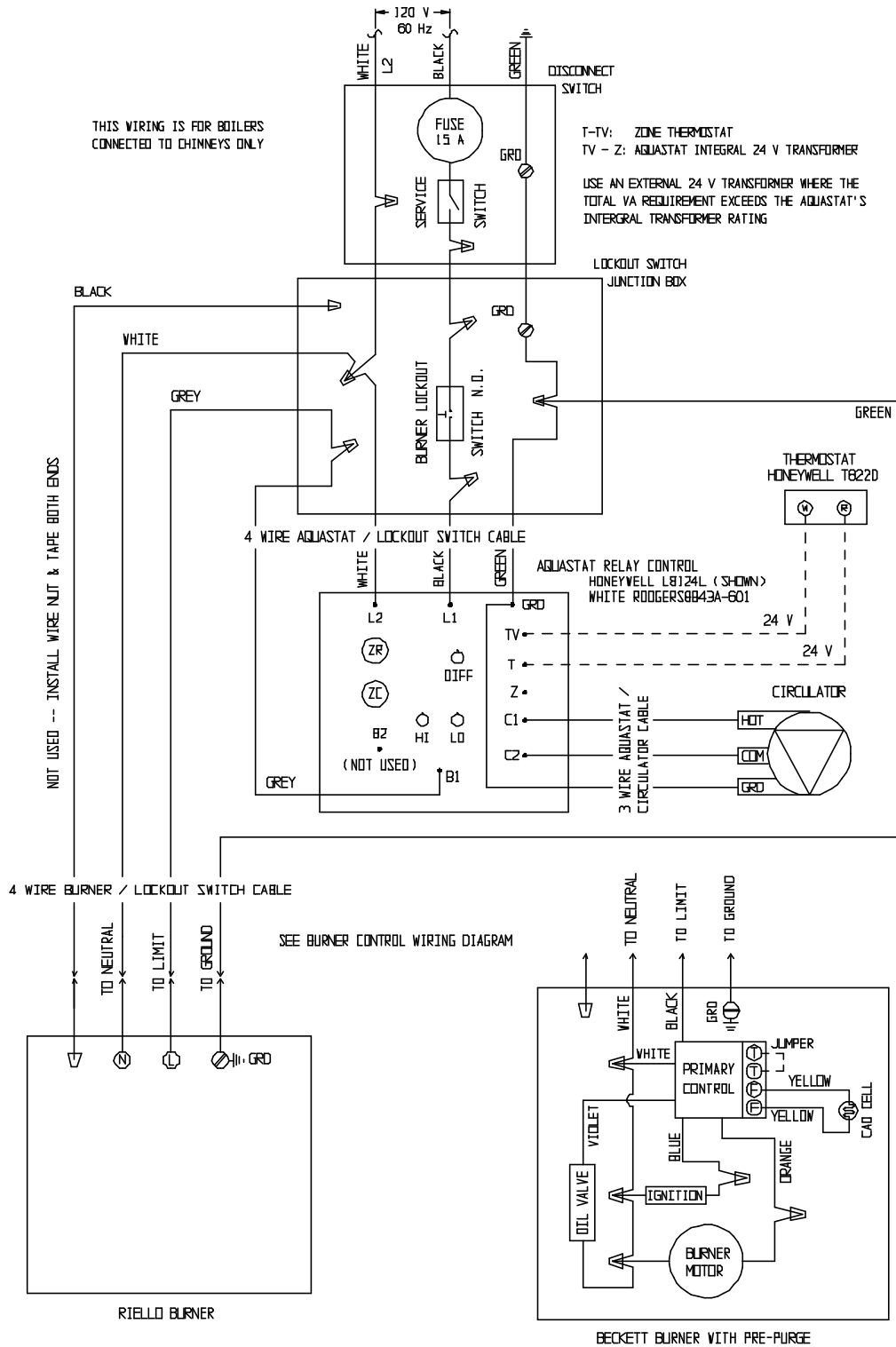
FIGURE 11 TYPICAL RADIANT FLOOR PIPING LAYOUT



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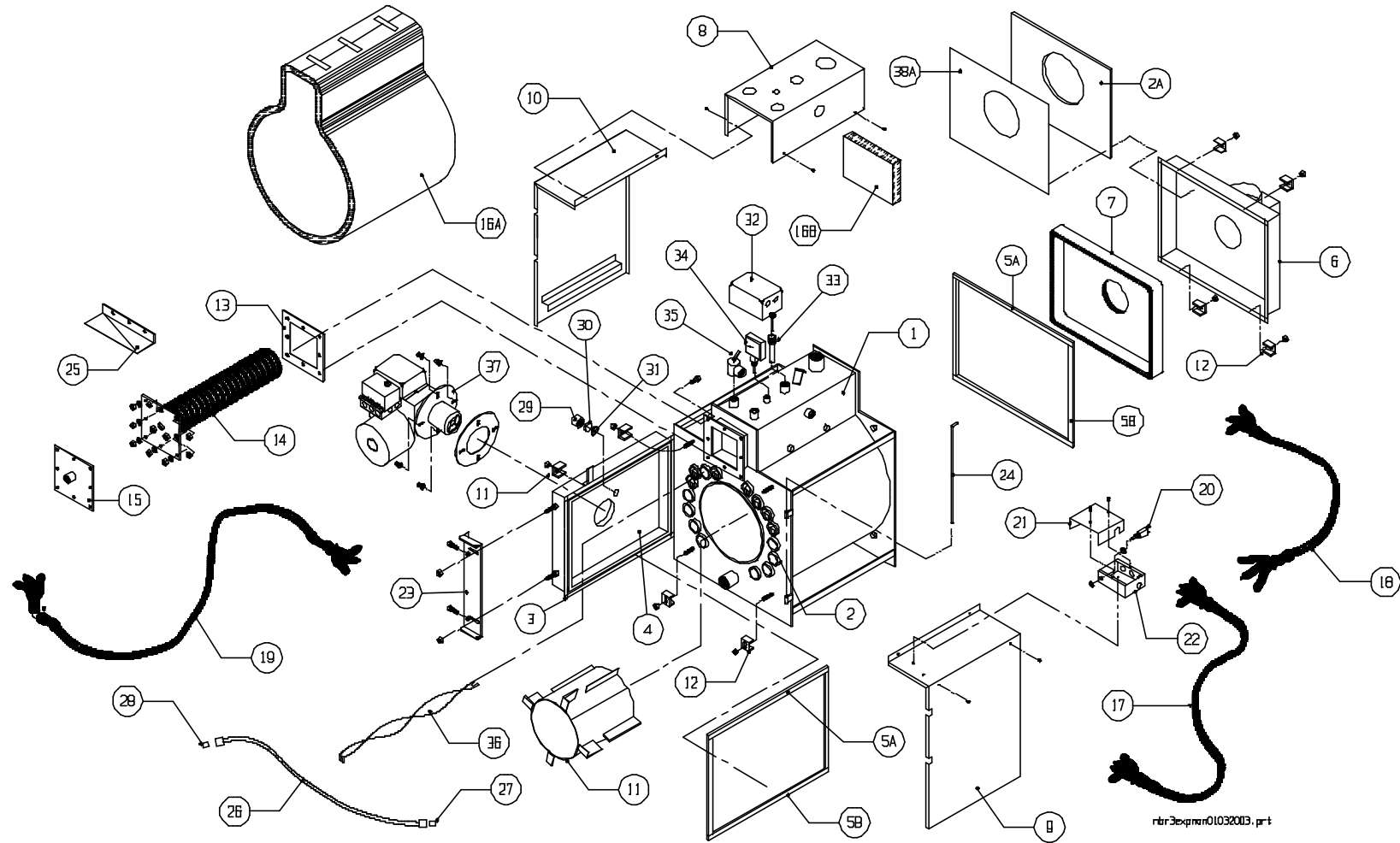


FIGURE 12 STANDARD WIRING SCHEMATIC



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**FIGURE 13 NBR 3001 EXPLODED ASSEMBLY**

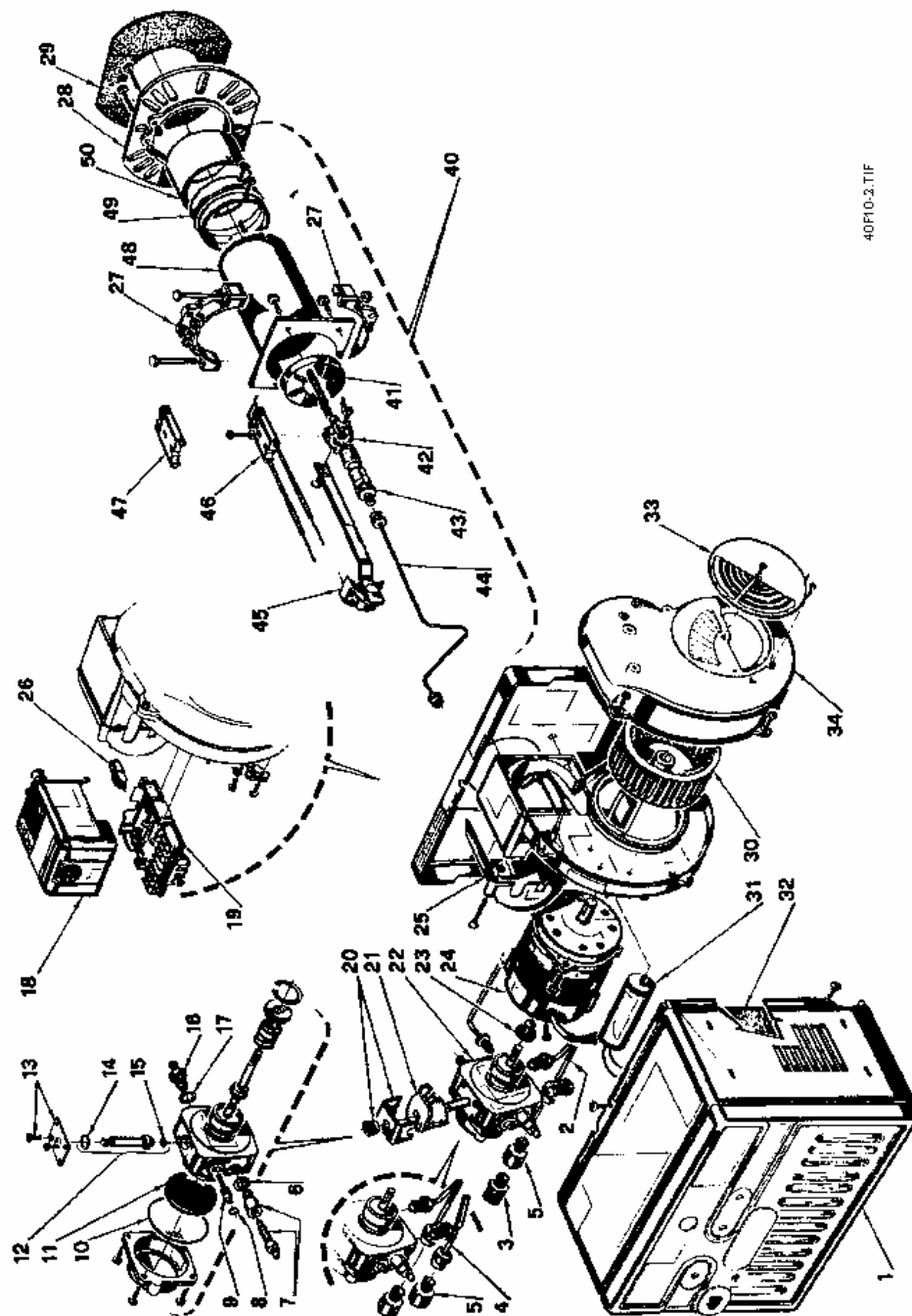


**TABLE 4 PARTS LIST**

Item	Part No.	Description
1 A	5010059LC	Standard Pressure Vessel Assembly (Less Coil)
1 B		CRN Pressure Vessel Assembly (Less Coil)
2 A	2080087	Rear Smoke Box Insulation
2 B	2080086	Front Smoke Box Insulation
3	4110584	Front Smoke Box
4	2030021	Smoke Box Liner – Front
5 A	3070027	Smoke Box Gasket (Top & Bottom)
5 B	3070028	Smoke Box Gasket (Right & Left)
6	4110585	Rear Smoke Box
7	2030022	Smoke Box Liner – Rear
8	4110583	Casing – Top
9	4110581	Casing - Right Side
10	4110582	Casing - Left Side
11	4060411	Combustion Chamber SS (Welded)
12	4110190	Smoke Box Brackets
13	2080044	Coil Flange Gasket
14	2190047-J	Domestic Hot Water Coil - 5 GPM
15	4110182	Coil Plate
16 A	3070025	Insulation, Fiberglass Shell
16 B	3070026	Insulation, Fiberglass Top Rear
17	4050207	Burner / Lockout Switch Cable
18	4050203	Aquastat / Lockout Switch Cable - 4 Wire
19	4050193	Aquastat / Circulator Cable - 3 Wire
20	2190067	Burner Lockout Switch
21	4110191	Lockout Switch Junction Box Cover
22	4110192	Lockout Switch Junction Box
23	4110586	Smoke Box Hinge
24	4110206	Hinge Pin
25	4110580	Coil Drip Tray
26	2190068	Flexible Oil Line *
27	2190071	Flexible Oil Line to Pump Adapter *
28	2190070	Flexible Oil Line to Tube Adapter *
29	2130036	Sight Glass Retainer
30	2080061	Sight Glass
31	2080060	Sight Glass Gasket
32 A	2010028	Aquastat - Honeywell L8124L *
32 B		Aquastat – White Rodgers 8B43A-601
33	2010049	Aquastat Well, Honeywell 123870AB *
34	2190085	Tridicator * (1/2 NPT Bottom Connection)
35	2190004	Pressure Relief Valve, 3/4 FPT X 3/4" FPT *
36	3100612	Firetube Baffle
37A	2110180	Oil Burner - Beckett CF 375 (NM 1001)
37B	5400022	Oil Burner - Riello F-10 Complete
38A	3100618	Insulation Shield, Rear
38B	3100617	Insulation Shield, Front
		Low Water Cut-Off, Hydroleve Model 550
	2170010A	Cleanout Brush
	2190003	Pressure Regulating Valve, 1/2" NPT Threaded Coupling X 1/2" NPT
	2190065	Backflow Preventer
		Circulator, Grundfoss
	2060006	Circulator Flange Kit, Grundfoss, Cast Iron, 519603
	2010001	Thermostat - Honeywell T822D
	2010057	Thermostat - White Rodgers 1F30
	2010080	Digital Thermostat (Mercury Free) - Erie T201C
	5010145	Standard Control Package
	2210293	Service Manual *
	2190063	1/2" Drain Valve
	2190084	Reducer Bushing, 2" X 1/2" FPT
	2190062	3/4" X 4" Pipe Nipple *
	2190038	3/4" NPT BI Plug *
	2190055	2" BI Plug *
	2040022	7" Barometric Draft Regulator

These items are included in the Standard Control Package

FIGURE 14 RIELLO F-10 EXPLODED ASSEMBLY

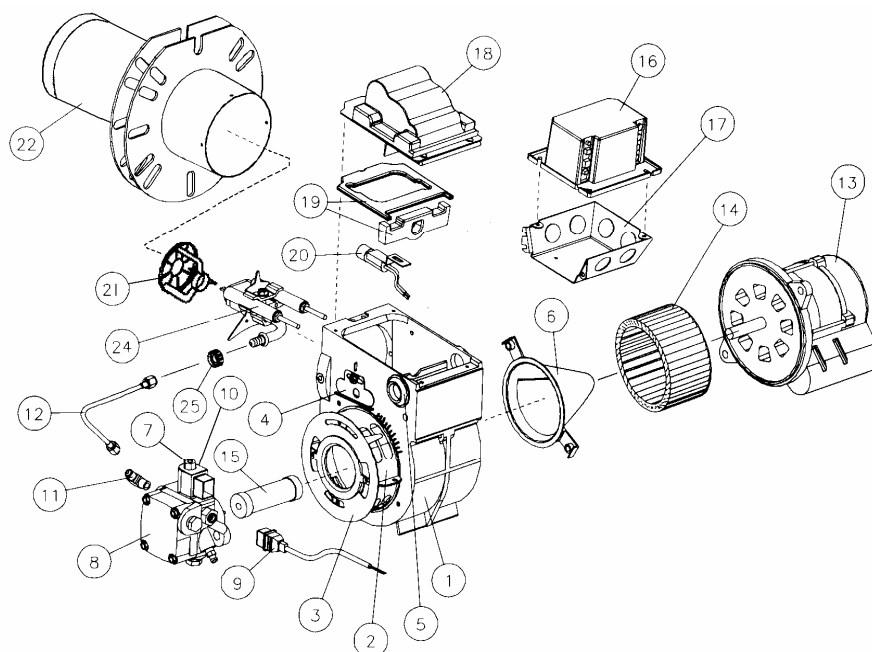


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**TABLE 5 RIELLO 40 F-10 PARTS LIST**

ITEM	PART NUMBER		DESCRIPTION
	RIELLO	NEWMAC	
1	3007234		Burner Back Cover
2	3006992		Pipe Connector – Supply
3	3006571		3/8" NPT/Metric Adapter – Male
4	3006993		Pipe Connector – Return
5	3005847		¼" NPT/Metric Adapter – Female
6	3007077		Crushable Metal Washer
7	3007568		Bleeder
8	3007028		O-Ring – Pump Pressure Regulator
9	3007202		Regulator Screw
10	3007162		O-Ring – Pump Cover
11	3005719		Pump Screen
12	3006925		Valve Stem
13	3007203		Valve Stem Plate
14	3007029		O-Ring – Valve Stem Upper
15	3007156		O-Ring – Valve Stem Lower
16	3007268		Nozzle Outlet Fitting
17	3007087		Crushable Metal Washer
18	3001157	2010048	Primary Control 530SE/C
19	3002278		Primary Control Sub Base
20	3006553		Coil U-Bracket and Knurled nut
21	3002279		Coil
22	3007802		Pump
23	3000443		Pump Drive Key
24	3005843		Motor
25	3007317		Air Tube Cover
26	3002280	2010045	Photo cell
27	3005854		Semi Flange
28	3005855		Universal Mounting Flange
29	3005856	2080058	Mounting Gasket
30	3005788		Fan
31	3005844	2090041	Capacitor 12.5 uF
32	3007357		Acoustic Liner
33	3007205		Manual Air Shutter
34	3007209		Air intake Housing
40	C8413310	2090076	Short Combustion Tube c/w conic end cone & milled
41			turbulator disc
42	3006966		Milled Turbulator Disc
43	3006965		Electrode Support
44	3006979		Nozzle Adapter
45	3006979		Nozzle Oil Tube – Short
46	3005888		Regulator Assembly – Short
47	3005890		Electrode Assembly - Short
48	3005869		Electrode Porcelain
49	3006981		Short Air Tube
49	3006983		End Cone Adapter
50			Conic End Cone
	2100028		Nozzle, Delavan 1.75 X 30° B
	2100029		Nozzle, Delavan 2.00 X 30° B

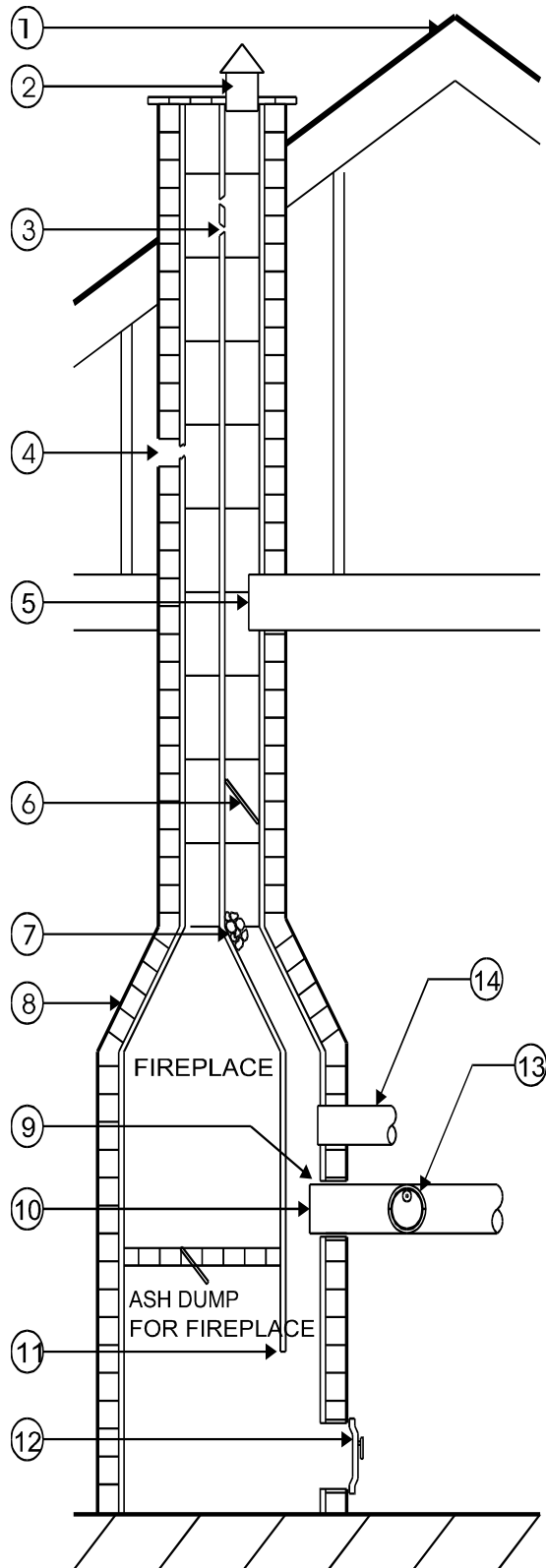
**FIGURE 15 BECKETT CF 375 EXPLODED ASSEMBLY**



**TABLE 6 BECKETT CF 375 PARTS LIST**

ITEM	PART NUMBER		DESCRIPTION
	BECKETT	NEWMAC	
1	5877	2090024	Burner Housing Assembly
2	3492		Air Band
3	3709		Air Shutter
4	5721		Adjusting Plate Assembly
5	2139		Hole Plug
6	31231		Air Guide
7	21877	2090072	Valve Stem (Clean Cut)
8	21844	2060012	Pump, Clean-cut (A2EA6520N621L)
9	21807		Valve Cordset (21844)
10	21755	2090065	Valve Coil
11	2256		Pump Nozzle Port Fitting
12	5394		Connector Tube Assembly (8")
13	21805	202019	PSC Drive Motor, 1/7 h.p.
14	21837		Blower Wheel (4.75" X 2.53")
15	2454	2090011	Coupling
16	7456	2090069	Primary Control, Honeywell R7184B
17	5770		Junction Box
18	51771	2090064	Electronic Ignitor
19	51304		Ignitor Gasket Kit
20	7006	2010006	Cad Cell C554A1455B Honeywell
21		2090078	Turbulator, V1 (1.48 to 1.65 USGPH)
		2090079	Turbulator, L1S (2.07 to 2.45 USGPH)
22		2090077	Air Tube c/w Welded Flange (2" Insertion)
23	3616		Flange Gasket
24			Electrode Assembly (5-3/4" Usable)
25	3666		Splined Nut

**FIGURE 16 COMMON CHIMNEY DRAFT PROBLEMS**



CAUSE	CORRECTION
① ROOF PEAK, BUILDINGS OR TREES HIGHER THAN CHIMNEY	EXTEND CHIMNEY HEIGHT
② COPING RESTRICTS OPENING	ENLARGE TO CHIMNEY INSIDE DIMENSIONS
③ BREAK IN CHIMNEY LINING	REPAIR MAKING SURE CONNECTIONS ARE TIGHT
④ OUTSIDE AIR LEAK	REPAIR AND SEAL ALL JOINTS
⑤ JOIST PROTRUDES INTO CHIMNEY	REMOVE TO GIVE FULL CLEARANCE
⑥ OBSTRUCTION IN CHIMNEY	DISLODGE AND REMOVE
⑦ SOOT ACCUMULATION IN OFFSET	REMOVE
⑧ OFFSET TOO SHORT	STRAIGHTEN OR LENGTHEN
⑨ LOOSE SEATED PIPE IN FLUE OPENING	SEAL AIR GAPS
⑩ SMOKE PIPE EXTENDS INTO CHIMNEY	MAKE END FLUSH WITH INSIDE OF CHIMNEY
⑪ OPENING BETWEEN FLUES	EXTEND FLUE PARTITION TO FLOOR LEVEL
⑫ LOOSE FITTING CLEANOUT DOOR	CLOSE TIGHTLY AND SEAL ALL LEAKS
⑬ TOO MUCH OR TOO LITTLE DRAFT	ADJUST DRAFT REGULATOR
⑭ TOO MANY APPLIANCES ON SAME FLUE	REMOVE OR RELOCATE APPLIANCES IN EXCESS OF MAXIMUM INPUT RATING
⑮ TOO MUCH DRAFT WITH DRAFT REGULATOR FULLY OPEN	INSTALL LARGER OR SECOND DRAFT REGULATOR
⑯ OPEN FIREPLACE	SEAL OPENING
⑰ SMOKE PIPE TOO CLOSE TO CHIMNEY BASE	RAISE SMOKE PIPE OR EXTEND INSIDE CUT ON ANGLE WITH OPENING FACING UP AND CLEAN REGULARLY
⑱ SMOKE PIPE EXTENDS TOO FAR INTO ELBOW	PULL SMOKE PIPE BACK
⑲ WIDELY FLUCTUATING DRAFT AND DOWNDRAFTING	TRY A DIFFERENT TYPE OF CHIMNEY CAP
⑳ UNUSED FLUE OR VENT CONNECTION	REMOVE
㉑ HOUSE DEPRESSURIZATION	PROVIDE ADDITIONAL COMBUSTION AIR
㉒ FLUE PIPE TOO LONG OR TOO MANY ELBOWS	MOVE APPLIANCE CLOSER TO CHIMNEY

## TROUBLESHOOTING CHART

PROBLEM	CAUSE	CORRECTION
Burner Motor Fails to Start	Thermostat	Check for Broken Wires
		Tighten Connections
		Clean Contacts
		Replace Thermostat
	Burner Motor Overload Tripped	Press Rest Button
	Ceased Pump	Repair or Replace
Burner Start--No Flame	Faulty Primary Relay	Repair or Replace
	Oil Supply	Check Oil Supply
	Air Leak in Oil Supply Line	Tighten Fittings or Replace Line
	Oil Line Plugged or Kinked	Clean or Repair
	Oil Filter Clogged	Replace or Clean
	Electrode Setting	Adjust Electrodes
	Loose or Dirty Nozzle	Replace Nozzle
	Ignition Transformer	Replace Transformer
	Burner Motor Overload Trips	Press Rest Button
	Ceased Pump	Repair or Replace
	Faulty Primary Relay	Repair or Replace
Burner Locks out on Safety	Cad Cell	Clean or Replace
	Oil Line Restricted	Clear Restriction
	Plugged Fuel Pump	Clean Strainer
	Cold Oil	Change to #1 Oil
	Poor Combustion	Adjust Air Settings Ensure Draft is Adequate
Burner Ignition Delayed	Air Leak in Oil Supply Line	Tighten Fittings or Replace Line
	Loose or Dirty Nozzle	Replace Nozzle
	Faulty Oil Pump	Repair or Replace Pump
	Oil Supply Line	Ensure Properly Designed
	Electrode Setting	Adjust Electrodes
	Cracked Electrodes	Replace Electrodes
	Wrong Nozzle	Use Specified Nozzle
	Low Oil Pressure	Adjust to Correct Setting
	Excess Air	Adjust Air Setting
	Faulty Transformer	Replace Transformer
Fumes & Odors From Burner	Insufficient Combustion Air	Provide Combustion Air
	Inadequate Flue Draft	Provide Specified Draft
	Pump Seal Leaking	Repair Pump
	Nozzle Assembly Adjustment	Ensure Setting is Correct
	Burner Adjustment	Check Using Instruments
	Blast Tube Burned Off	Check Blast Tube
	End Cone Wrong or Burned Off	Check End Cone
	Incorrect Insertion	Measure Insertion Depth
	Dirty Burner Fan	Clean Blades
	Damaged Chamber	Check Chamber
	Clogged Flue Passages	Clean Flue Passages
	Nozzle After Drip	Check Fuel Delivery System
	Unspecified Nozzle	Replace Nozzle



## TROUBLESHOOTING CHART

PROBLEM	CAUSE	CORRECTION
Not Enough Heat	Firing Rate Too Low	Use Higher Input Nozzle
	Dirty Heat Exchanger	Clean Heat Exchanger
		Flush Boiler Water
	Improper Aquastat Settings	Change Settings
	System Air Locked	Purge Air
	Poor Combustion	Adjust Using Instruments
	Undersized Capacity	Size Based on Heat Loss
	Distribution System	Ensure Proper Design
Too Much Heat	Faulty Thermostat or Location	Repair, Replace, or Relocate
	Defective Primary Control	Repair or Replace
	Faulty Oil Pump	Check for Proper Pressure
	Improper Aquastat Settings	Change Settings
	Firing Rate Too High	Reduce Nozzle Size
	Flow Control Valve Stuck Open	Repair or Replace
	Oversized Capacity	Size Based on Heat Loss
	Distribution System	Ensure Proper Design
Inadequate Domestic Hot Water	Aquastat Set Too Low	Change Settings
	Aquastat Defective	Repair or Replace
	Aquastat Location	Mount on Coil Plate
	Tempering Valve Defective	Repair / Install Tempering Valve
	Excessive Water Pressure	Reduce Flow Rate
	Dirty Coil	Flush Coil
	Mixing Valve Not Properly Set	Adjust Mixing Valve
	Excessive DHW Consumption	Install Indirect Water Heater
	System Air Locked	Purge Air
	Firing Rate Too Low	Install Larger Nozzle
	Oil Pump Pressure Too Low	Increase Pump Pressure
	Coil Inlet & Outlet Reversed	Pipe as Specified
Excessive Oil Consumption	Poor Combustion	Adjust Using Instruments
	Excess Air	Adjust Air Setting
	Inadequate Flue Draft	Provide Specified Draft
	Insufficient Combustion Air	Provide Combustion Air
	Oil Supply	Check Oil Supply
	Electrode Setting	Adjust Electrodes
	Wrong Nozzle	Use Specified Nozzle
	Fuel System Leaking	Check Fuel System
	Faulty Oil Pump	Repair or Replace Pump
Relief Valve Blows Off	Pressure Reg. Valve Setting	Set Below 25 psi.
	Expansion Tank Too Small	Increase Size or Add Another
	Expansion Tank Water Logged	Drain Expansion Tank
	Expansion Tank Bladder Leak	Replace
	Defective Relief Valve	Replace Relief Valve
Short Cycling	Improper Aquastat Settings	Change Settings
	Over-Firing	Use Specified Nozzle Size
	Faulty Thermostat or Location	Repair, Replace, or Relocate
	Heat Anticipator Set Too Low	Adjust Heat Anticipator
	Defective Primary Relay	Repair or Replace Relay

## TROUBLESHOOTING CHART

PROBLEM	CAUSE	CORRECTION
Burner Pump Whine	Suction Line Air Leak	Tighten Connections
Hydronic System Noise	Pipe Expansion	Provide Free Movement
		Install Expansion Compensator
		Install Piping Offset
		Eliminate Long Straight Rigidly Supported Runs
Trapped Air in Hydronic System	First Fill	Purge Air From System
	Inadequate Deaeration	Use High Point Vents
		Use a Central Deaerator such as an Air Scoop or Microbubble Resorber
	Low System Pressurization	Install Circulator on Supply Side
		Install Expansion Tank on Inlet Side of Circulator
		Adjust Feed-Water Valve to Maintain a Minimum of 5 psig at Top of System at all Times
	Water-Logged Expansion Tank	Clear Expansion Tank
	Expansion Tank too Small	Use Larger Expansion Tank
		Install Multiple Expansion Tanks
	Diaphragm Ruptured	Replace Expansion Tank
	Low Flow Velocity	Use Correct Size Piping
		Use Properly Sized Circulator
		Reduce Excessive Pipe Length
Inadequate Time for Deaeration	Allow 3 days for air to purge	
Burner Air Tube Burn-Off	Blocked Flue Passages	Clean Boiler
	Unspecified Burner	Replace Burner
	Unspecified Nozzle	Install Correct Nozzle
	Incorrect Head	Install Correct Head
	Wrong / Misaligned Static Plate	Install Correct Plate or Align
	Chimney Down Drafting	Install Chimney Cap
	Poor Over-Fire Draft	Increase Draft at Breech
		Correct Chimney Problems
	Over-Firing	Use Specified Nozzle
		Use Specified Pressure
	Incorrect Insertion	Use Correct Air Tube Assembly
Adjust Flange		
Frequent Sooting	Reduced Draft	Add Combustion Air
	Delayed Ignition	Adjust Burner Settings
	Unspecified Burner	Replace Burner
	Unspecified Nozzle	Install Correct Nozzle
	Incorrect Head	Install Correct Head
Premature Corrosion	Return Water Too Cold	Ensure Minimum Return 135 F
	Non Oxygen Barrier Piping	Use Oxygen Barrier Piping
	Anaerobic Bacteria in System	Add Corrosion Inhibitor
	Make-Up Water Entering	Properly Size Expansion Tank
	Oxygen in System	Install Automatic Air Vents

## **IMPORTANT HOMEOWNER INSTRUCTIONS**

1. AN EMERGENCY POWER SWITCH IS REQUIRED TO BE INSTALLED IN A CONVENIENT LOCATION AT A SAFE DISTANCE FROM THE BURNER. THIS SWITCH INTERRUPTS THE ELECTRICAL SUPPLY CIRCUIT TO THE APPLIANCE. MAKE SURE YOU ARE AWARE OF ITS LOCATION AND THE OFF POSITION IS CLEARLY MARKED.
2. KEEP THE SPACE CLEAR AROUND THE APPLIANCE WITHIN THE SPECIFIED CLEARANCES TO COMBUSTIBLES.
3. ENSURE THE SUPPLY OF COMBUSTION AIR TO THE APPLIANCE IS NOT OBSTRUCTED OR CUT-OFF.
4. MAINTAIN PROPER VENTILATION OF THE APPLIANCE AREA.
5. MAINTAIN FREE AIR FLOW THROUGH THE RETURN AIR REGISTERS. \*
6. CONTACT SERVICE PERSONNEL BEFORE REMODELLING.
7. CONTACT SERVICE PERSONNEL FOR ANNUAL SERVICE AND MAINTENANCE.
8. CONTACT SERVICE PERSONNEL FOR AIR FILTER REPLACEMENT. \*
9. CONTACT SERVICE PERSONNEL BEFORE AND AFTER EXTENDED PERIODS OF APPLIANCE INOPERATION.
10. THE BURNER IS FULLY AUTOMATIC IN OPERATION. ALL ADJUSTMENTS SHOULD BE MADE BY A QUALIFIED TECHNICIAN. DO NOT PUSH THE RESET BUTTON MORE THAN ONCE.

CAUTION : DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE APPLIANCE IS FULL OF VAPOUR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT.

11. **CAUTION : DO NOT TAMPER WITH THE APPLIANCE OR CONTROLS—CALL YOUR SERVICE PERSONNEL.**
12. **DO NOT USE GASOLINE, CRANKCASE OIL, OR ANY OIL CONTAINING GASOLINE**
13. ALWAYS KEEP THE OIL SUPPLY VALVE SHUT OFF IF THE BURNER IS SHUT DOWN FOR AN EXTENDED PERIOD OF TIME.
14. DO NOT START THE BURNER UNLESS THE BLOWER ACCESS DOOR IS SECURED IN PLACE.
15. NEVER BURN GARBAGE OR PAPER IN THE HEATING SYSTEM, AND NEVER LEAVE PAPER OR RAGS AROUND THE APPLIANCE.

\* FURNACES ONLY

## INSTALLER INFORMATION

NAME: \_\_\_\_\_

COMPANY: \_\_\_\_\_

INSTALLATION DATE: \_\_\_\_\_

THE HOMEOWNER SHOULD TELEPHONE (     )                      FOR SERVICE OR  
ADDITIONAL INFORMATION.

MODEL: \_\_\_\_\_

## APPLIANCE INITIAL TEST AND SERVICE INFORMATION

1	FUEL INPUT (USGPH)	
2	FUEL PRESSURE (PSIG)	
3	FLUE PRESSURE (INCHES W.C.)	
4	OVERFIRE PRESSURE (INCHES W.C.)	
5	NOZZLE ANGLE / PATTERN	
6	CO <sup>2</sup> PERCENT	
7	BURNER MODEL	
8	FLUE GAS TEMPERTURE (F <sup>o</sup> )	
9	ROOM TEMPERTURE (F <sup>o</sup> )	
10	SMOKE NUMBER (BACHARACH)	
11	FUEL GRADE NUMBER	
12	WATER PRESSURE	
13	SUPPLY TEMPERATURE (F <sup>o</sup> )	
14	RETURN TEMPERATURE (F <sup>o</sup> )	
15	TEMPERATURE RISE (F <sup>o</sup> )	
16	LIMIT CONTROL FUNCTIONING PROPERLY	
17	PRIMARY CONTROL SHUT OFF TIME (IGNITION FAILURE)	
18	PRIMARY CONTROL SHUT OFF TIME (FLAME FAILURE)	

## NBR (LIMITED) BOILER WARRANTY

Effective July 1, 1995 and subject to the following conditions Newmac Manufacturing Inc. warrants the Oil Fired BOILER, to the original owner purchaser, under normal use and repair, against defects in workmanship and materials for a period of one calendar year from the date of original installation. This warranty does not cover nozzles, filters, etc. that may be contaminated at time of installation.

The burner, controls or any other electrical or mechanical components not manufactured by Newmac are warranted for a period of one year from date of original installation by their respective manufacturers; most burners have 3 years.

Effective July 1, 1995 and on the date of original installation Newmac warrants for a period of twenty (20) years to the original purchaser that the Boiler Shell of the NBR Oil Fired BOILER will be free from defects in material and workmanship provided however, this warranty shall apply only to the original installation of the BOILER in a single dwelling unit used without interruption by the purchaser as his or her principal residence. This warranty is subject to the conditions and exceptions of warranty listed below.

Under the above warranty Newmac Mfg. at its option will repair or replace the shell under the above terms or offer the then current applicable retail price of a boiler shell towards a new equivalent BOILER. Proof of original purchase will be required.

The warranty must be registered within 30 days of installation or the following pro-rated warranty "Twenty Year Warranty" applies.

Where the owner of the dwelling is not the original purchaser and in multi-family dwellings Newmac warrants the boiler shell against defects in materials and workmanship under a 20 year Limited Warranty subject to the conditions and exceptions listed below and on a prorated basis as follows of the then current retail price

	<u>Years</u>		<u>Warranty</u>		<u>of Retail Price</u>
0-10		100%		0	
11-12	"	50%	"	50%	"
12-14	"	40%	"	60%	"
14-16	"	30%	"	70%	"
16-18	"	20%	"	80%	"
18-20	"	10%	"	90%	"
20 years and over	"	0%	"	100%	"

The purchaser must pay all other costs of warranty service including labor costs involving diagnostic calls and or removing, servicing and or replacing warranty parts and or warehousing charges and or freight costs. All parts are supplied F.O.B. Debert, Nova Scotia and the defective parts must be returned freight prepaid for repair and or warranty consideration when requested by Newmac Mfg.

### CONDITIONS

This warranty refers to the Boiler SHELL only. In order for this warranty to be effective:

1. The BOILER must be installed by a qualified licensed installer and in accordance with Newmac's installation instructions. The BOILER must also be installed in accordance with all applicable, local states, or provincial codes and the INSTITUTE of BOILER and RADIATION MFG., or generally accepted equivalent standards.
2. The BOILER must operate in an environment not contaminated by halogens (such as but not limited to fluorine or chlorine) or chlorinated hydrocarbons. These corrosive chemicals entering the combustion area cause rapid deterioration of inner surfaces leading to heat exchanger failures. The BOILER must be maintained and cleaned on an annual basis by qualified personnel. Oil filters and nozzles must be changed annually.
3. The BOILER must be sized and fired correctly as stated on the label for the residence. The label must not have been defaced or removed.
4. The BOILER must not be modified from its published design or purpose.
5. The BOILER must not have been removed from the original installation site.
6. Warranty on the boiler, when used with a Floor Radiant Heat System will only be valid if tubing with complete OXYGEN BARRIER is used.
7. There must be adequate combustion air installed to the BOILER room; and in the case of sidewall venting there must be adequate ventilation air in addition to combustion air to prevent depressurization of the home.
8. Warranty components may be replaced with reconditioned parts at the discretion of Newmac Mfg.
9. Proof of original purchase will be requested under this warranty.
10. Proof of failure must be supplied in writing within (30) days of failure.

### EXCEPTIONS

1. All labor, freight or diagnostic calls, removal and replacement costs and warehousing charges are the responsibility of the purchaser including the return to Debert, Nova Scotia of defective parts.
2. Defects or damages caused by failure of the refractory chamber, improper installation, wiring, electrical current characteristics, accident, misuse or abuse, fire, flood, alteration and or misapplication of the product, default or delay in performance; caused by war, government restrictions, restraints, strikes, material or freezing.
3. Refractory chamber, nozzles, etc...
4. Defects or damages caused by nozzle failure and/or plugging and/or oil flow restrictions due to cold oil from outside tanks or misalignment of burner at installation.
5. This warranty in no way can be considered as a guarantee of workmanship of an installer connected with the installation of the Newmac Oil Fired BOILER or as imposing on Newmac any liability of any nature for unsatisfactory performance as a result of faulty workmanship in the installation which liability is expressly disclaimed.
6. This warranty will not be applicable if the BOILER is damaged or a result of being improperly serviced or operated.

### LIMITATIONS ON WARRANTY

Newmac will make no express warranties other than the warranty set forth above. All implied warranties including the implied warranties of a merchantability and fitness for a particular purpose are limited to the duration of the express warranty, set forth above. Liability for incidental and consequential damages are excluded regardless of the cause. Some provinces in Canada and some states in the U.S.A. do not allow limitations on how long an implied warranty lasts so the above may not apply to you. The expressed warranties made in this warranty are exclusive and may not be altered, enlarged or changed by any distributor, dealer or any other person whatsoever. All replacement parts whether new or remanufactured, assume as their warranty period on the remaining period of this warranty. For routine service requirements contact the dealer who installed the equipment originally, or an alternate qualified and registered heating dealer or electrical.

## **LIMITED WARRANTY REGISTRATION**

PLEASE PRINT OR TYPE:

Owner's Name.....

Address of Installation.....

Date of Installation.....

Dealer's Name.....

Dealer's Address.....

Boiler Serial No.....Boiler Model No.....

Newmac Mfg. Inc., P.O. Box 9, Lancaster Cr., Debert, NS B0M 1G0